COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper Second class postage paid at Boston, Mass

Vol. 2 No. 21 May 22, 1968 Price $9/year

TC500 Terminals Now Available Here

The Burroughs TC500 terminal computer can pre-process and concentrate data before sending it on to a central computer and can expand data received from a central computer or from another TC500.

DETROIT, Mich. Burroughs Corp. has announced its TC500 terminal computer will be available for delivery in the United States in January. The terminals, first sold in the United Kingdom, are basically accounting machines with the addition of logic, a small head-per-track disk holding up to 1280 words, and a communications interface.

Shortly after the announcement in the United States, Burroughs received orders for 1700 units and was hoping the new system would turn out to be one of its major products.

The terminal computers are able to pre-process data, thus greatly reducing the work that has to be done by the central computer. In addition, any differences in local conditions, such as document formats, can be handled by the terminal itself, using its computer to create a standard form of input for the central computer

Line-Load Minimized

The terminals can concentrate the data which is to be transmitted. In normal operations there would be a number of terminals on a leased or private line. While the buffer size is not actually fixed and can be varied from terminal to terminal, normally a buffer size of 256 characters (one of the tracks on the disk) would be used. This buffered data can then be transmitted using the full line frequency (if it is under 2000 bits per second), releasing the communications line to other keyboards. The carrying capacity of the line is effectively increased, thereby reducing the cost per individual transmission.

The system includes a carriageless keyboard, with a 64 symbol character set, and a double webbed paper carrier so that two different forms can be handled from the same keying station. Both red and black printing is available, and up to 16 different programs can be entered by using the keyboard control.

Five Models Available

Five models are currently available, varying in size of memory and program capacity. Purchase price varies from $9900 to $14,400 per terminal.

TC500s were first sold to Barclay's Bank in England in April, 1967, and have since been sold to a number of other banks in the United Kingdom. However, the prime market in this country is the general industrial market. One Midwestern bank is planning to use the systems for inquiries, opening and closing accounts, and other customer services, a Burroughs spokesman said

None Delivered Yet

While Burroughs has been accepting orders in Britain since 1967, none of the units has yet been delivered. Deliveries also will begin there in January

Input and output peripheral devices available for the TC500 can handle punched tape, edge punched cards, and 80 column punched cards.

2301 Drive Prices Set

NEW YORK MAI is now taking orders for its 2301 disk drive, with deliveries to begin in about four months. The 2301 is a plug-for-plug compatible replacement for the IBM 2311 and has a 33% faster access time.

The 2301, made by Memorex, sells for $20,000 and leases for $500 per month. An optional maintenance plan for purchasers is available at a minimum charge of $50 per month, MAI announced.

The MAf 2301 is the first non-IBM disk drive available for use with the IBM 360, but other independent manufacturers are expected to follow suit.

MAI claims the 2301 has an average access time of 50 milliseconds, as compared to 75 millisec. for the IBM 2311 Model 1 which it replaces.

The 2301 uses an electric motor instead of a hydraulic motor, a feature which simplifies maintenance.

MAI has an agreement with Memorex to market and service the drives.

Bankers Confer on Automation

BAL HARBOUR, Fla. – "The electronic data processing industry is maturing," Burroughs Corp. President Ray W. Macdonald said Monday in the keynote address at the American Bankers Association conference here. The FDP industry will be increasingly competitive, he predicted, because more and more companies will be supplying computers, peripheral equipment, and communications devices. What this means to bankers is that they will find a "broader range" of supplies and systems available.

Some 1700 bankers arrived here Sunday and Monday for the three day ABA National Automation Conference on "S.O.S. – Services of the Seventies." The conference at the Americana Hotel will consist of general sessions in specialized areas, and a variety of special attractions such as open committee meetings, theatrically produced "main tent" performances, and a large bank automation display.

AT&T revealed on the first day of the conference that it is dropping all production of 10 button telephones in favor of 12 button phones The extra buttons are primarily needed for communicating with computers, but an AT&T spokesman said the utility also planned to use them to handle new telephone services

Bankers Must Set Goals

Discussing the EDP industry's "sensitivity" to the needs of commercial banking, Macdonald said, "The principal responsibility for setting goals for the highly automated systems of the future 'checkless society' lies with bankers" Therefore, the EDP industry's responsibility is to "advise and counsel" and to follow the directions set by bankers

'Continue Spirit of Cooperation'

In his address entitled. "S.O.S. Services Of the Seventies," Macdonald said that his industry must do an even better job in the future than it has done in the past. He urged that the spirit of cooperation already existing between the EDP and banking industries be continued, and that

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Software Companies Organize

WASHINGTON, D.C. Eleven independent software firms, with sales of more than $100 million annually, have formed a trade association to handle common problems such as competition with "not-for-profit organizations" and protection for proprietary programs The firms, geographically spread over the United States, chose Washington as the natural site for their joint operations because of the need to work with government and other official bodies.

The organization in the course of formation for some 14 months, is called the Association of Independent Software Companies (AISC). The members are hoping to attract other qualified organizations into the group

President of the new group is William Wolf of Wolf Research and Development. The vice presidents are William T. Miller, Jr. of Aries Corporation and Walter Bauer of Informatics. Other firms represented include Applied Data Research, Auerbach, Computer Applications, Computer Usage Development, Computing & Software, Comress, Merle Thomas, and Planning Research.

More EDP Stocks Decline Than Gain

A predicted "correction" occurred in the stock market late last week on news that Russian troops were moving toward the Czechoslovakian border News that progress was being made toward the enactment of an income tax surcharge and the initiation of federal spending cuts tempered the bad news Losers outnumbered gainers among computer stocks two to one (52 to 25) and the Software & EDP Services sector was the only one to show an increase over the previous week CW's Computer Stock Composite Index did

(Continued on page 11)

Policies Displayed

Life insurance companies are beginning to use display terminals to facilitate answering inquiries from customers. An operator can get instant access to the policy by keying in the policy number. By using the IBM 2260 display, above, the Fidelity Union Life Insurance Co., Dallas, handles an average of 1000 inquiries a day. The unit is connected to an IBM 360/30.

Challenges of Automated Banking Discussed at National Conference

(Continued from page 1)

computer manufacturers try to be even more responsive to commercial banking needs.

'Turbulent Waters'

Bankers have moved through the "turbulent financial waters" of the past several years with great power and sense of security, ABA Vice President Willis W Alexander said at the opening day luncheon. "Automation may pose its problems for us but it also offers opportunities."

The problem for small banks is the fact that "expansion of computer capacity . . tends to provide its own thrust." Once an installation is made, the ample capacity takes on the appearance of idle, excess capacity. There is a strong incentive to make use of this "costly excess capacity" by providing new services to customers, by using the computer for routine procedures "that might be done just as economically by traditional methods," and by producing reports and analyses not previously regarded as feasible

The opportunity for small banks lies in their inherent ability to provide each customer with the kind of personal attention which is not possible in larger institutions. "Properly used, automation can make it possible for the small banker to devote even more time, and that of his staff, to enhancing this aspect of his business," said Alexander, who is president of Trenton Trust Company, Trenton, Mo.

"The crux of the problem," Alexander said, "is to select the system which meets current needs as economically as possible but also provides sufficient capacity to handle future growth over a period of time in which the investment will pay for itself "

He said he anticipates accelerated progress in the development of equipment and procedures designed with the small bank in mind.

Bank Gets More Done With Fewer Machines

BAL HARBOUR, Fla. State Street Bank and Trust Company, Boston, has installed six third generation computers and increased processing volume by 35 per cent, while reducing the number of computers from 12 to nine, Vice President James A. Hayden, Jr., told an ABA conference workshop session. Inflated equipment expense was avoided, he said, by substantially increasing machine utilization and by minimizing expansion of rerun time. The bank's operations personnel took part in a formal education program covering new hardware, software, applications, and language. State Street Bank has had a man working full time on the use of quality control techniques in the operations department since September, 1967, Hayden said.

EDP Quality Control

Timeliness and accuracy are the two main quality characteristics that banking EDP must be concerned about, Jack E Taylor, assistant vice president, quality control, First National City Bank of New York, said in the workshop The development, maintenance, and improvement of product quality are the aims of quality control, which should "establish the proper balance between quality costs and customer satisfaction." Quality control in data processing is part of everyone's job under a new concept called "total quality control," pioneered by Dr A.V. Feigenbaum of GE. The initial quality control organizational structure in a bank "may simply be the identification and consideration of the quality responsibilities and activities performed by various groups within data processing," Taylor said. "The official designating and titling of a quality control unit may in fact not be needed if quality can be achieved and assured in a decentralized manner."

Third generation computers are causing concern "among the users of this equipment regarding their ability to schedule it and to achieve optimum throughput in this new environment," said F R McCrea, manager of Ernst & Ernst, New York. "But, if we take an analytical view of this problem, we find that conditions have not changed so much." Third generation equipment can do more than one job at a time, and may be viewed as a group of machines operating at the same time in the performance of different tasks. It is still necessary to schedule information flow from point of entry to final output, and the computer scheduling is just part of this task, McCrea told the bankers. "I know of no canned program or package that will do your computer scheduling for you " There are certain software packages in the form of supervisory systems or operating systems that he said can help, but most of these need alteration "to fit your particular environment At the most, they will schedule the computer only " Effective scheduling must start with input, continue through processing, and end with delivery of reports, McCrea said.

Automated Bank Services Improve 'Profitability'

BAL HARBOUR, Fla. – Automated customer services (ACS) can offer profit opportunities competitive with other bank services, and they have the potential of "expanding the scope of banking to the status of a full financial utility," Charles H. Chappas, vice president of the Citizens and Southern National Bank, Atlanta, told an ABA conference session Monday.

Banking activities in the ACS area are being challenged in the courts and the American Bankers Association has entered legal briefs as *amicus curiea* (friend of the court) defending the banks' right to offer such services.

Decisions on whether to provide automated customer services can have a "profound effect" on the profitability of a bank, Chappas said. "Automation is a revolutionary force in banking which, if controlled and directed by careful planning and evaluation, will resolve many problems, pitfalls and questions."

New Challenges

Changes in, and development of new techniques present new challenges to banks. What is needed is "new types of personnel," with knowledge in systems analysis, programming, scheduling, and advanced equipment with communication technology. Chappas added, "Planning, knowledge of costs and marketing strategy for computer services are required to a degree never before necessary in banks."

Full utilization of automated customer services may enable banks to realize "an entirely new dimension," which involves the transformation of banking from a static, money processing business to a "dynamic financial services" industry, according to the bank executive.

"The question before us at present is not whether to use computer technology in banking, but rather one of the degree to which Automation will be used for better internal information and control and for the most significant external customer services," he said.

Users Told to 'Select'

BAL HARBOUR, Fla – How to get the user involved in project selection and control was discussed by Dwight H. Mensinger, vice president of Central National Bank, Cleveland, at the ABA conference here. Executive decisions should be reviewed when sources of ideas for a project are desired, and corporate objectives are an important factor in selecting projects. The impact of data on profit and loss, and the speed and accuracy of a project, are among selection criteria that steering committees should consider.

It is an ideal difficult to attain, Mensinger believes, but the objective treatment of a project ought to involve purely nonpolitical considerations. For example, the profitability of a project should be determined in advance. It is therefore important to know how to cost a project, how to get information, and what the mechanics are of handling information within a project.

Discussing "Organization and Management for Project Control," Mensinger suggested that there is a problem in the jumping around from project to project and from area to area within a project.

Watching the Coats

Data processing management must select those applications which are most profitable to the bank, said Louia Greenspan, assistant vice president, First National State Bank of New Jersey, Newark, N.J. "No matter how academically interesting it is, systems work which does not pay is worthless in the commercial environment."

Aim of Automated Bank Systems Should Be to Benefit Customers

BAL HARBOUR, Fla – How to win public acceptance of an electronic payments system was discussed at the ABA Conference by Burton I. Weinstein, assistant vice president, Franklin National Bank, Garden City, New York. "Let's make sure that our preoccupation with the technological doesn't work to the detriment of our customer," he warned. Forty one per cent of the families in the United States pay their bills with cash, and 59% of the total population has one or more credit cards. Sixty five per cent of the population age 18 and up has some form of checking account, and as family income exceeds $10,000 per year, the figure increases to 84%.

Under a "direct flow system," the customer could inspect his bills and sign the ones he wishes to pay. The bank would use a data recorder to prepare magnetic tapes with control totals indicating the accounts to be credited at various banks. The tapes would be sorted, and the information transmitted to the respective banks.

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New System Processes Commercial Loans, Prepares 56 Reports

LOS ANGELES – A software system for commercial loan transactions, one of the most profitable but least automated areas of banking operations, has been developed by Computer Sciences Corp.

Called CL/1 (commercial loan), the system is a complete information processing and reporting system designed for a basic configuration consisting of an IBM 360 with 64K, two disk units, and four tape or disk drives. It may be operated in either a disk operating system or operating system environment.

Computer Sciences is marketing CL/1 for $30,000.

"Only 3% of the 1400 leading banks in the country had automated their commercial loan bookkeeping by 1967," said Geoffrey H. Thomas, director of marketing for CSC's Computer Sciences Division. "And yet up to 70% of the average bank's investments and income are in commercial loans.

"One of the reasons for this neglect is the complex system it requires," he said.

CL/1 eliminates the bookkeeping machine and also provides bank management with reports which were either unobtainable previously or which could be produced only with several days of effort, he said.

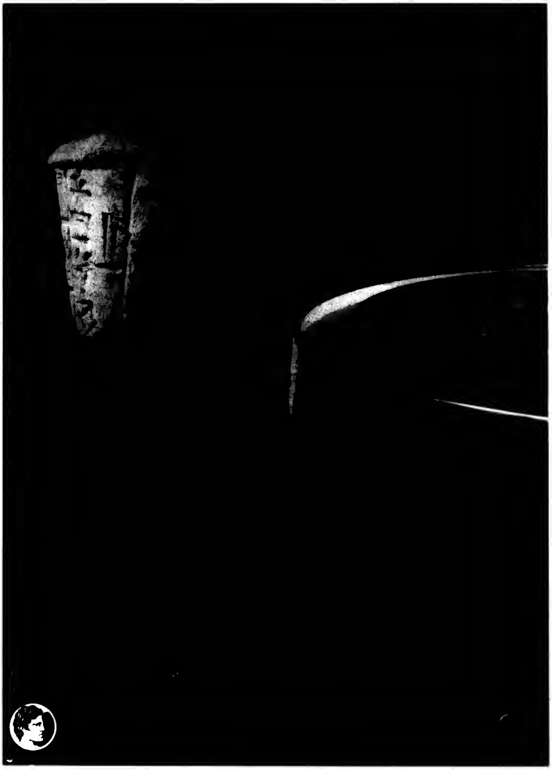
The system, written in Cobol, enables the user bank to perform commercial loan accounting for other banks as well as processing all of its own loan transactions at it headquarters and branch offices.

For loan officers, the system provides case histories of their accounts upon request in any of a number of optional formats, thus making the typical two day or three day wait for reports unnecessary. It also automatically notifies the loan officer of notes approaching maturity or past due.

For management, CL/1 analyzes and lists the accounts in the bank's commercial loan portfolio according to risk, industry, and liquidity. These reports, usually difficult and time consuming to obtain through manual methods, provide management with valuable information in managing portfolios, controlling risk accounts, and anticipating the need for funds.

The output of CL/1 includes 56 types of reports, of which 42 are optional. Required reports include statements, daily transaction journals, notes with zero principal and active interest listings, changes to interest accruals, daily accounting summaries, and general ledger transactions.

Optional reports include monthly analyses of accounts, officer profiles, and industrial classifications; lists of participated notes; disposition of matured notes; portfolio position analyses, customer histories; and collateral file pricing lists.



Hearings Expected On Bill to Prohibit Accounting Services

WASHINGTON, D.C. – A bill that would bar commercial bank and savings and loan associations from performing professional accounting services will be the subject of House Banking and Currency Committee hearings, according to sources on Capitol Hill. But passage of the bill is impossible in the current session of Congress, Davis S. Nahm, staff executive for Rep. Spark M. Matsunaga, D-Hawaii, said recently.

The bill would prohibit banks from designing and supervising accounting classification of particular transactions, preparing financial statements and tax returns, and auditing accounts of businesses. Matsunaga, the bill's sponsor, has expressed alarm over the incursion of banks into "non-banking activities" such as credit cards, equipment leasing, and accounting services. He believes "there ought to be a law to keep bankers bankers."

Limited Coverage

But Matsunaga so far has expressed no interest in the court fight between banks and the Association of Data Processing Service Organizations over the right of banks to offer EDP services.

The proposed law, H.R. 11438, would be limited in its coverage. Banking institutions would not be forbidden to perform routine bookkeeping and record keeping services for their depositors, borrowers, or other customers – for which the banks' data processing equipment or other capacities may be adapted. Banks' trust departments in their role as trustee also would be exempt under the Matsunaga proposal.

The bill is based on the belief that separation between banking and accounting is essential to the independence and freedom from conflict of interest of the two functions.

Athana to Market New 11-Disk Packs

HIGH POINT, N.C. – Disk packs for the IBM 2314 disk drive will be marketed, starting in July, by the Athana Corp.

The new Athana 2316 packs meet or exceed IBM specifications and performance standards, the firm stated: The 11-disk packs will sell for $650 and lease for $20 per month.

The Athana packs will be marketed from Athana's branch office in the First Union National Bank Building here and from its main office in the Del Amo Financial Center, Torrance, Calif., as well as through representatives in major cities.

Shares Projected

CHICAGO – A "bank book for the future," showing each employee what his profit sharing stake can be at age 65, was used by Wallace Business Forms, Inc., this year to emphasize its profit sharing program.

Projections made by a computer assumed continuations of current levels for the employee's salary, the company's annual contribution from profits, and the growth of funds through investments.

Editorials

Professional Conduct

On this page we have recently been concerned with the value of claims made for the IBM 360/85. During our appraisal, we had occasion to ask IBM what standards it used prior to making such claims. The company's first answer was that it had no specific standards, on a corporate level, but that each of the divisions presumably had its own. Further inquiry to the IBM Data Processing Division revealed that a claim was tested out and checked with a number of technical people to insure accuracy.

At no stage have we found any evidence that any firm in the computer field is using careful, consistent standards for performance claims.

But there are standards, standards which members of the ACM, including corporate members, are expected to use as a guide in relations with the public. They are included in the ACM's "Guidelines to Professional Conduct."

COMPUTERWORLD feels that these guidelines are perhaps not adequately known to the members of the profession. We suggest that you look them over. After all, ethics are a personal responsibility on all of us. If you don't have a copy, the guidelines are reproduced on Page 13.

The Missing Side

One of the problems of this industry is obtaining proper presentations of unpopular views. This has always been a problem, and wise men who have held views somewhat at variance with those of the masses, or whose views are not quite understood, often keep silent to avoid criticism.

But mature comment is very valuable and can be advantageous in most cases.

It might be well if the actual problems facing the two giant corporations – IBM and AT&T – could be determined sympathetically by some outside group and then criticisms could be bounced off this group so that the public could learn how valid – or how invalid – these criticisms are.

Is this a job for ACM?

COMPUTERWORLD
The Newsweekly for the Computer Community
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Weekly Newspaper - Second Class Postage Paid at Boston, Mass. Published every Wednesday by COMPUTERWORLD, Inc., 60 Austin St., Newton, Mass. 02160. Telephone: (617) 332-5606 & TWX: 710-320-6635. Copyright 1968 by COMPUTERWORLD, Inc.

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Subscription rates are: $9 for one year, $16 for two years. Add $1 per year for Canada; $3 per year for Foreign. Please send all editorial and subscription material to: COMPUTERWORLD, 60 Austin St., Newton, Mass. 02160. (617) 332-5606.

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Measure for Measure

Are Claims for the Model 85 Meaningful or Misleading?

This is the last in a series of articles examining claims made by IBM for the System 360 Model 85.

Mentioned in this series are the facts involved in claims made by IBM for their newest System 360 - Model 85. For the purpose of this "Measure for Measure" feature we have not checked the actual performance (we do not have that capacity), but we have checked the available data to support the claims.

Our findings show that:

- The claim of a maximum speed of 12.5 million instructions per second was useless in evaluating the system. No known program had been timed at that rate and actual programs would have operational rates substantially below this.
- The claim that the required data would be found in the buffer 95% of the time was not adequately supported and could not be relied on for any particular program.
- The claim that the Model 85 was up to three times faster than the Model 75 omitted the information that special, extra cost features were assumed to be present that only some of the Model 85 main frames were possible candidates, and that the result claimed was not the result of a measurement but of a simulation where the experimental tolerances were so large that the result quoted was not experimentally certain.

Under the circumstances, we must now return to the original question: Are the claims *meaningful, meaningless, or misleading?*

How the Claims Measure Up

Claims made by IBM in their announcement of the Model 360/85 on January 29, 1968*	Computerworld's Opinion: Meaningful or Meaningless?	Reliable or Misleading?
Up to 3 times faster than the 360/75	Meaningless	Misleading
Between 3 and 5 times faster than the 360/65	Not examined	Not examined
Can execute instructions at a rate of up to 12,500,000/second	Meaningless	Non-proven**
Most powerful system currently available commercially	Not examined	Not examined
The required data will be in the buffer 95% of the time.	Meaningless	Misleading

* There were only five actual performance claims included in the announcement and its documents. All of these, whether they have been examined by Computerworld or not, are included here so that readers can see the total picture, and so evaluate the importance (or lack of importance) of the claim which we have examined.

** An old Scottish verdict given when a jury did not wish to find a defendant "guilty" or "not guilty."

The Claim of 12.5 Million Instructions/Second

It was purported that the Model 85 main frame could execute instructions at a rate of up to 12.5 million instructions per second.

The facts are that actual programs on the standard Model 85 appear to have a maximum instruction per second rate of between 2 million instructions per second (for decimally based programs, such as Cobol object programs) up to 9.5 million instructions per second (for scientific programs).

COMPUTERWORLD feels that from the point of view of the user the claim certainly is not meaningful. He can't use it to estimate the speed of any of his programs. He can't use it to compare the productivity of the system with that of other systems. He can use it only to play computer one-upmanship (if he has a careful copywriter).

It is COMPUTERWORLD's opinion, therefore, that *the claim is meaningless.*

Is it misleading?

It might be.

If users were buying computers based on their instructions per second rate and bought the Model 85, based on the 12.5 million figure, it certainly would be. However, COMPUTERWORLD knows of no such case and its opinion is that *the claim is not known to be misleading.*

The Claim That Required Data Would Be Found in the Buffer 95% of the Time

The small size of the sample, and its potential bias, if regarded as an overall average, makes this claim meaningless. There is nothing in the wording of the claim which prevents a user from believing that, in this particular program, the data would be found in the buffer 95% of the time, so the fact that programs are already known where this condition does not apply makes the claim misleading.

COMPUTERWORLD finds that *the claim is both meaningless and misleading.*

The Claim That the Model 85 Was Up to Three Times Faster Than the Model 75

This claim discloses no frequency at which the suggested ratio might be achieved, nor does it suggest what performance is to be expected at another time. On the surface, it might be justified, if one program in a million came up to this ratio, even though at all other times the programs ran slower on the Model 85 than on the Model 75.

COMPUTERWORLD believes that the claim allows people who are considering the two-way interleaved or the four-way interleaved Model 85s (which are not fitted with the special features) to expect their systems to be three times faster than the Model 75 although the experimental results indicate otherwise. Therefore *the claim is misleading.*

However, since starting to publish this series, COMPUTERWORLD has noted that the claim can also be misleading in a totally different way.

The fact is – people don't read the claim correctly.

The claim "up to 3 times faster" would appear to be one of those tricky phrases which the human brain simplifies. It forgets the qualification. It simply reads, "is 3 times faster." This is a very different claim and one with which IBM spokesmen do not

(Continued on Page 5)

IBM's claim "up to three times as fast" was reported in two magazines as "three times as fast."

MODERN DATA SYSTEMS APRIL, 1968

The IBM System/360 Model 85 is said to be IBM's most powerful system except for the Model 91 which was offered to customers on a limited basis. The Model 85 is three times faster than the Model 75, the next most powerful System/360 available.

DATAMATION *March 1968*

The 360/85, through increased use of memory hierarchies, becomes the fastest generally-available System 360, operating at three times the model 75 speed on typical instruction mixes. Indeed, says IBM, in some jobs it achieves the same speed as the larger limited-production model 91, which is optimized to floating-point.

High Speed Printers Are Now Becoming Outmoded

by Alan E. Taylor

When commercial computers were first introduced some 20 years ago, they were, in some ways, more "modern" than most of today's systems. Univac 1, for instance, had 11 tape drives but no card reader or high speed printer to hamstring its processing speed. The only other peripheral was the console typewriter. Off to one side, a typist typed directly onto magnetic tape, on the Unityper, using the same basic methods that IBM is now using in its Model 50 data inscriber, introduced just a few weeks ago. In another corner, there was a rather noisy, four piece unit transcribing the data from magnetic tape to paper at the then fabulous rate of 600 lines per minute. This was the high speed printer.

Later a "standard" computer appeared that had an on-line card reader, which could handle up to 1400 to 2000 cards per minute, and an on-line high speed printer, with an output of 1100 to 1400 lines per minute. Sometimes a punch was included.

But, as computers became faster and faster, the inefficiencies of these on-line systems became more obvious. There appeared to be some very basic limitations on top speed (we have hardly doubled the speed of the early 1950 printers).

Most printers still use a hard to read, all capitals character set that was designed for printing speed, not for maximum human comprehension.

The question has been raised: Does the on-line high speed printer have a future? Ideas being put forward today suggest that the answer is no, that the day of "raw" computer printed output is coming to an end.

Currently the end has come only where there exists an unusual economic justification for switching to other methods.

However, standard printers are by no means cheap, and shortly it may be found that other types of printing units can compete with them in cost.

What will replace the high speed printer? A number of clues are available.

One is the computer printer/plotter, such as the Stromberg Datagraphics 4020. This system parallels the original methods used in the Univac 1, except that the data is printed on microfilm from a CRT. The second step, the transfer of data from film to paper, is comparable to off-line printing systems. But the speed, up to 15,000 lpm, and therefore the throughput, are greater. And the character sets and general layout are much more controllable and, frankly, much more acceptable.

The computer printer/plotter is meeting with impressive acceptance. Datagraphics, formerly Stromberg-Carlson, reports that it has over 130 of its 4020 units in the field, and a substantial number on order.

SD has given the name "micromation" to the process of recording computer data directly onto microfilm, and then converting the microfilm frames to paper copies in a selective and controlled manner.

Microfilm printing techniques are being applied in a variety of businesses and industries. A number of the leading users are banks. According to R.T. Wyler, a banking systems consultant for Stromberg, a bank using the SD micromation system can "print from film to paper at speeds such as 240 four-up customer statements per minute. Labels for proxy notices can be produced at the rate of over 200,000 per hour."

Several banks are among the present users of micromation systems. One of them, First National City Bank of New York, is studying generation of customer statements via Stromberg's film-to-paper printer. Citibank is presently generating historical records and dynamic, high reference data via an on-site SD 4400 computer microfilm recorder. This system prints on microfilm at 15,000 lpm, while the larger SD 4440's throughput speed is 20,000 lpm.

According to Wyler, a specific look at applications by banking functions indicates the value of microfilm printing in a bank information system.

"Demand deposit accounting is a large paper generating operation, perhaps the largest in branch banking. Branch reports can be generated directly on film and distributed to branches where retrieval can be affected rapidly on inexpensive viewers. Customer statements, the bulk of bank printing, can be handled in the same manner by simply generating the customer's hardcopy directly from film to paper. Both methods are off-line and surprisingly economical and fast.

"Corporate trust systems and stock transfer systems produce transaction journals, dividend lists, voting records, and holders

(continued on page 10)

Letters to the Editor

'Journal' Story Attacked

To the Editor:

Enclosed is a copy of my message to the chapter which will appear in the May 1968 issue of the San Fernando Valley Chapter, Data Processing Management Association, Data-Gram.

I was very chagrined when I read the Journal article, and I thought you might be interested in my comments.

James A. Case, Manager
Data Processing Department
Southern California Water Co.

President's Message

There was recently handed down in my company (and I wonder in how many of yours) from the President to the Manager, Data Processing an article which appeared in the usually august Wall Street Journal that reached a low point in newspaper journalism. If you haven't seen it, this is how it started:

"WHIR, BLINK- JACKPOT!/ Crooked Operators Use Computers to Embezzle Money From Companies/Auditors Hampered by Lack of Written Records; Some Firms Unaware of Losses/ Programming a $250,000 Theft."

The article started with the comment, "I could steal a company blind in three months and leave its books looking balanced," boasts Sheldon Dansiger, a burly, 33-year-old data processing specialist. The Journal then went on for three columns and developed this theme. Just for good measure an article inset was entitled "Could Computer Trickery Swing a National Election?"

Although I am not a constant reader of the Journal, I have always respected its content and considered it to be responsible to its readers for reasonable and credible reporting. That is, till now.

Fortunately for all of us, another periodical called COMPUTERWORLD (very appropriately it would seem), carried two articles in its most recent issue, one an investigation of the *facts* which the Journal had neglected to gather or report and the other – an editorial which I thought was restrained, charitable and dignified.

Those of you who read this exchange of journalistic broadsides probably heaved a great sigh of professional relief at the good guys in white hats that came *writing* to the rescue. But again, it points up a very basic fact of human nature which we must understand and an approach we must adopt if we are to achieve our own professed goals. First, people (generally) don't trust what they don't understand. If you as a manager, programmer or other, hide behind an esoteric vocabulary and exclude management from your in-group cast of confidants then you are vulnerable to the barbs and shafts of doubt and suspicion. If on the other hand, you take every conceivable step to insure that management is constantly "on-board" and apprised of what you are up to, a large part of the mystery will be dispelled. When setting up a system of application – be sure, doubly sure that an auditor, controller, treasurer or chief executive signs off on the controls or audit trail design. Make sure that it satisfies them before it satisfies you. Make sure that it tranquilizes their doubts – not those of your programmer staff.

I believe we owe at least one letter of gratitude to COMPUTERWORLD. And I think we better all read the Journal with perhaps a better of different perspective.

James A. Case, President

Preventing Embezzlement

To the Editor:

Certainly "dishonest computer operators" add a different dimension to the area of embezzlement. However, the rules of internal controls need not be changed because of the introduction of computerized accounting. As a Certified Public Accountant, I insist that information provided by computers be subject to the same rules of audit, verification and confirmation as manually produced data.

If information cannot be "controlled" from an accounting point of view, it is worthless. Embezzlements and defalcations that continue for any length of time are due to poor management, inadequate internal controls and inadequate auditing techniques.

Irving L. Adler CPA
Kirshner, Yellin & Co.
Boston

Model 85 Investigation Summarized

(Continued from Page 4)

agree. But people *do* make the mistake – even technical people who are experienced in the computer field, even people accustomed to checking their work because they are going to publish it.

In the April 1968 issue of "Modern Data Systems" a description of the 360/85 opens with the following paragraph:

"The IBM System/360 Model 85 is said to be IBM's most powerful system except for the Model 91 which was offered to customers on a limited basis. The Model 85 is three times faster than the Model 75, the next most powerful System/360 available."

No mention of "is said to be," although the writer felt it necessary to cover himself in this way with regard to the Model 91. Just a plain, incorrect statement.

Of course it can be argued that one swallow does not make a summer – and one error in a single publication is hardly indicative of anything. COMPUTERWORLD makes errors too. But let's see how another technical magazine covered the Model 85. The March 1968 issue of "Datamation" opens its report as follows:

"The 360/85, through increased use of memory hierarchies, becomes the fastest generally available System 360, operating at three times the Model 75 speed on typical instruction mixes."

Here the writer has also misread the IBM documentation (unless there is something that we have missed). Here the claim is made so definitely that even the methodology of what it was based upon (typical instruction mixes) is given.

As we stated before, these claims were published while COMPUTERWORLD was publishing its series on the Model 85 and serve to confirm our feelings.

COMPUTERWORLD believes *the claim is misleading.*

Timing of 'Loads' and 'Stores'

At first we assumed that the Model 85 store instructions took the same time as load instructions.

Then we noted that the Technical Report, while talking a great deal about loads, made no mention of store instructions or their timings. We also noted that the program cited as the "worst case" test involved many loads – but few stores. So we checked a bit further.

We found that the store instruction timing given in the Functional Characteristics Manual was four times longer than that for the load instruction. This was stated to be for random data and was apparently for any Model 85.

Checking further, we found that while the data being stored might be random, the addressing of the areas where the stores were being made had been optimized, and that only in one case out of 256 would this optimum timing actually be achieved! Moreover, this optimization required 4-way interleaving, which only some Model 85s have.

There we left it. We had enough for our purposes. But if you are examining the Model 85, take a good, hard look at the store instructions, their timings, and their implications. They just [illegible]en't like anything else we've ever seen.

Item 1: 1401-C3, 1402-1, 1403-2: Card system with print storage, with expanded print and other features.
Available Immediately
Item 2: 1401-E4, 1402-1, 1403-2, 1406-1 and 5-7330's. The system is loaded presently in a bank. Excellent environment. Extra features include: M/D, serial I/O, Disk adapter, process overlap.
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Device Punches Ballots

Boston College students vote for campus council members using a new table-top vote recorder developed by the Seiscor division of Seismograph Service Corp., a Raytheon subsidiary. Students inserted their punched card ballots in the unit and pressed a stylus to punch a hole opposite the candidates of their choice. The 2015 ballots were then processed by computer in three minutes.

'Dial-a-Vote' Proposal Could Speed Elections

WASHINGTON, D.C. – The election system can now be radically changed by the application of computer technology. It has been proposed that local and state governments as well as the federal government allow citizens to vote by telephoning an election computer. Ways of preventing vote fraud under such a system have been devised by specialists in the field of secrecy and classified information. The necessary technology exists.

A first step was taken April 24 when 1,071,637 college students cast punched card ballots in the National Collegiate Presidential Primary. The data, indicating first, second, and third choice for President, and opinions on national issues, was transferred to tape and processed by computer.

More Voters Likely

Major increases in the number of citizens participating in the electoral process are anticipated if each voter could directly dial an election computer on his home telephone. In a typical American election, more than 20% of registered voters stay home, and many persons eligible to vote do not even register.

One of the factors in motivating a person to act is the "distance" between the person and the recommended behavior. "Distance" may be measured in both psychological and physical terms. Either way, it is felt that the motivation to vote would be strengthened by the dial-a-vote system.

Secret Ballot?

There are at least two methods of preventing vote fraud under the proposed system:

The voter would identify himself by dialing his social security number. The election computer would then check its memory to make certain that the same person had not already cast a ballot in the same election.

A person would record a sample of his voice when he registered to vote. If, for example, an imposter dialed John Doe's social security number and tried to "steal" his vote, an analog analyzer would compare the imposter's voiceprint to that of John Doe, and the imposter's vote would be invalidated. A voiceprint, according to some experts, is an even more precise form of identification than a set of fingerprints.

The secret ballot, an essential element of the democratic process, has two requisites: that each person's vote be counted, and that each person's vote be secret. Both of these conditions would be met more fully than they are today under a completely computerized election system. The capability of EDP equipment to tally election results with maximum efficiency is unquestioned. This diminishes the possibility of miscounted or uncounted votes, and it might eliminate the need for laborious recounts of close elections. Sophisticated methods of assuring secrecy in systems as advanced as the proposed National Data Center have been developed by experts in the growing field of classification of information.

Cost Not Prohibitive

The cost of a national election system using private telephones and public computers "would today not be prohibitive," according to Dr. Carl Hammer, director of scientific and computer services for the Univac Federal Systems Division here.

"We could then immediately learn the opinions of the U.S. adult populace on national issues, and social scientists would have a complete computer analysis of how the preferences related to segments of society," he said.

The cost of the optional voiceprint security system might still be too high today, he conceded, but even that problem will be overcome as early as 1978, Hammer believes.

"You cannot hold up progress. There are many things in technology that are looked upon as unpleasant by a lot of people. But we live in a changing world of technology and you cannot stop it, you cannot prevent advances from being made," he told COMPUTERWORLD.

"As a scientist I say not only is it possible to hold elections this way, but I advocate it, and I believe it will be done," Hammer said, adding that this was a personal opinion.. "Local and state committees can be set up to get the system started. I think we will find that there is a natural process of evolution. It will begin at the local level, then the state level, and finally reach the national level. It will happen through a kind of feedback process.

The First Step

"Choice '68," the national student poll, was the first time punched card ballots were used on a large nationwide scale. It was also a milestone in the development of computerized balloting and voting systems, Hammer said.

Although the system used punched cards instead of telephone calls, it could set the organizational pattern for a national dial-a-vote system. The punched cards were sent to Univac branch offices in Los Angeles, Chicago, and Silver Spring, Md. where 1004 card processors transferred the data to 26 tapes. At Los Angeles, preprocessed in 35 hours; at Silver Spring, 600,000 cards were preprocessed in 90 hours.

The tapes were then sent to the nation's capital, where the data was compressed onto three reels. After four hours of preprocessing on the Univac 1108, these were boiled down to one binary tape, and the final processing took under a quarter of an hour.

On a real-time system, such as those Hammer expects will be used in the next 5-10 years, preprocessing would not be required, and the total processing time needed for a national election could be measured in minutes.

'Primary' Also Recorded Opinions

WASHINGTON, D.C. – Sen. Eugene McCarthy, D-Minn., with 285,988 votes, won the National Collegiate Presidential Primary. Sen. Robert F. Kennedy, D-N.Y., with 213,832 votes, came in second. Richard Nixon, with 197,167 was third.

But the results, while interesting, were not the significant thing about the poll of 1,071,637 students because most of them are too young to vote. The significant thing was that the poll also sought opinions on national issues. The results were then calculated as percentages of the total vote and separately for each candidate.

If the system were used in an actual election, each winner would be able to find out the opinions of the public as a whole and also the opinions of the persons who voted for him.

For example, 45% of the students favored a phased reduction in U.S. military activity in Vietnam and 18% favored withdrawal.

But among those who voted for Nixon, only 32% favored phased reduction and only 7% favored withdrawal. The largest Nixon vote, 35%, came from students favoring an all-out military effort in Vietnam.

This could indicate that, if elected, Nixon should work for phased reduction (the national sentiment) while being careful not to alienate the war block (his supporters) by allowing the reduction to be considered a retreat.

The students were asked to give their opinions on how the nation should act on three national issues. The chart below shows a breakdown of the vote for each of the three leading candidates for each of the issues. It also shows a breakdown of the vote for all candidates on each issue. It should be remembered, in reading the percentages, that the students gave only their first priority: for example, the 38% who listed "job training" for the highest priority might, for instance, have considered "riot control" second most important.

U.S. MILITARY ACTION IN VIETNAM

Candidate	Withdrawal	Phased Reduction	Current Level	Increase	All-out effort
McCarthy	29	56	4	3	8
Kennedy	19	51	7	7	16
Nixon	7	32	10	16	35
Total Vote	18	45	7	9	21

BOMBING OF NORTH VIETNAM

Candidate	Cessation	Suspension	Current Level	Intensify	Use Nuclear
McCarthy	52	29	7	10	2
Kennedy	30	34	12	20	4
Nixon	10	23	15	45	7
Total Vote	29	29	12	25	4

URBAN CRISIS

Candidate	Education	Housing	Income Subsidy	Job Training	Riot Control
McCarthy	39	7	5	42	7
Kennedy	39	8	3	41	9
Nixon	41	5	1	33	20
Total Vote	39	7.4	4	38	12

Brain Studies May Improve Computer

NEW YORK – Laymen quickly started calling the first computers "electronic brains," and computer scientists have been trying ever since to convince the public that computers have no relation to human brains.

Now, however, computer scientists have decided their judgment may have been too hasty. This does not mean scientists believe that machines can "think." It means that they now believe further developments in computer technology may lie in finding out how the human brain works.

A First Step

The present state of man's knowledge about the brain is comparable to the beginning of the Industrial Revolution, one expert says,

"In the chemical coding of information and in the advances in the computer functions, scientists are in possession of the first discoveries, the steam engine and the spinning jenny, but still have to find the nature of the exact applications to the brain and its function," said Dr. Samuel Bogoch, head of the Foundation for Research on the Nervous System, Boston.

Not Cybernetics

The application of knowledge about the brain to computer development is the opposite of cybernetics, which deals with the comparative study of complex electronic calculating machines and the human nervous system in an attempt to explain the nature of the brain.

A major obstacle to advances in both these areas is the fact that computer scientists know little about biochemistry and biochemists know little about computer science. Improved interdisciplinary awareness was one of the goals of a conference co-sponsored here this month by the foundation and the Manfred Sakel Institute of New York.

Theoretical models that are based on storage and retrieval of past experiences are not able to account for man's capacity to hypothesize and to predict, Heinz von Foerster, professor of electrical engineering at the University of Illinois, told the conference.

Proteins Are Renewed

Scientists have found that proteins in the brain are somehow involved in the processes of memory and learning. "Learning glycoproteins" are either signposts (the actual substance itself) or spell outs (switches for the currents in circuitry), according to Bogoch. A glycoprotein is any of a class of compounds in which a protein is combined with a carbohydrate group.

Discovery of means of influencing the process of synthesis in a positive manner, so that glycoproteins function at an optimum level for all age groups is the ultimate aim of studies of protein synthesis in the brain, Dr. M. Sinex, chairman of the biochemistry department at Boston University School of Medicine, told the conference. Synthesis is the formation of a complex chemical compound by the combining of two or more simpler compounds or elements.

Future of Banking Is Tied to Automated Services

BOOKS

Impact of Computers on Banking, by James A. O'Brien, assistant professor of finance, Eastern Washington State College. Banker's Publishing Co., Boston.

This book is the result of "an intensive and systematic inspection of the literature available on banking uses for computers," and intensive case studies of five commercial banks.

The first chapter sets the stage for a presentation of the various effects of EDP on the individual commercial banks by reviewing the origins and early development of computers in the banking industry.

Recent developments are discussed in later chapters which examine specific areas of banking affected by computers, based on studies by the banks and as reported by them in the literature. The areas include commercial banks and services, bank information systems, the financial problems involved, and the impact of the computer on the organization. Dale Reistad, in the foreward, points out that there is a great deal more significance to this story than the mere use of computers to improve and expand services. The banks will have to provide an "integrated money management service" for future customers that will be based on computers and this, in fact, is a computer revolution.

It is unfortunate that the book does not really live up to its billing. Many sections of it were apparently written in the early months of 1966 and refer to events which "will" happen later in 1966. Far too much of the material apparently has come from press releases rather than from an examination of actual operations. Moreover, there appears to be a definite one-sided slant in the author's examination of the literature he talks about. There is, on page 2, reference to a Univac I and a GE-100. As far as this review can find, no reference is made to any other computers, except IBM's, until page 194 (in the appendix) where contenders at one of the banks are listed as being IBM, Honeywell, RCA, Univac, and Burroughs (IBM won). These are the only references to non–IBM computers to be found in the book. On the other hand, there are many pages with as many as five explicit references to IBM! All the banks studied have IBM systems. Details of only IBM user groups are given.

This is a pity, because with a reasonable representation it could be an extremely valuable text for adding to our knowledge. Even now it is probably one of the best overall documentations of the problem. We do, therefore, recommend the book for reading, but the reader should be aware of its faults as well as its virtues.

Ransom Computer Sciences

Has scheduled a series of seminars for management on teleprocessing systems design, "Teleprocessing Horizons." Courses will be held in:

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Atlanta, Ga.: June 6,7
Washington, D.C.: June 13,14

Course provides attendee with ability to evaluate teleprocessing plans, participate effectively in teleprocessing, design products, and analyze applicability of teleprocessing to his organization and its requirements. Course Fee: $200.00

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MAI

Banks Work Toward Checkless Society

Laying the groundwork for the much discussed "checkless society," a pilot group of five banks is working with National Cash Register Company, Dayton, Ohio, in pioneering automated central information files (CIF). The NCR Century Series computer will be at the heart of the CIF installations. Participants are First National Bank, Lake Forest, Ill.; Capital National Bank, Houston; Union National Bank, Manhattan, Kans.; Bank of Sussex County, New Jersey; and Citizens Baughman National Bank, Sidney, Ohio. Two Cleveland savings and loan associations, Cleveland Federal and Second Federal, also are forming a computer service that will make a central information file available for immediate inquiry on the status of any customer.

Orders and Installations

Comshare, Inc., Ann Arbor, Mich., has ordered four SDS 940 time sharing computers and related equipment valued at over $5 million from Scientific Data Systems. They will be used to expand the scope of the Comshare network in the Midwest and the South, increasing the number of 940s operated by Comshare to seven. Comshare currently operates time sharing computer centers in Detroit, Chicago, and Houston.

Second National Bank, Ashland, Ky., has ordered a Burroughs B300 Electronic Data Processing System. The leased system will be installed in September to automate banking operations such as checking accounts, savings accounts, installment loans, Christmas Club accounts, and proof and transit.

Knox Gelatin, Inc., Johnstown, N.Y., producer of gelatins for food and industry, plans to install a computer that will join five plants in a single data network. The National Cash Register Century 100 system is to be delivered in April, 1969. Applications will include customer billing, sales analysis, general ledger, inventory control, and payroll.

ITT Research Institute, Annapolis, Md., will obtain a $2.4 million Univac 1108 computer system to be used for scientific applications under the government sponsored Electromagnetic Compatibility Analysis Center project. Also an 1108 computer system valued at more than $1.8 million has been ordered by the University of Rome for use by students, the Italian National Nuclear Power Committee and other agencies. Another 1108 System will be installed at the Institute of Technology, Milan, Italy.

High Speed Printer's Future in Doubt

(continued from page 5)

lists, to name some, and here again the same flexibility of output is available, film and/or paper as user requirements dictate."

"Personal loan histories make excellent micromation applications. They are easy to generate, easy to store, and easy to reference."

Wyler emphasized that computer to microfilm technology has both short range and long range implications for automated customer services in banks. They offer flexibility of generating film and/or paper as demand dictates. Banks can now offer film records instead of costly paper versions to customers on a reduced fee basis while reducing bank computer operating costs.

An alternative to having your own special printing equipment is to use an outside printing service. when computers first became available, computer tapes could be processed only in the computer room, and all work had to be done there. This is no longer true. Computer tapes now are used for numerical control and other functions throughout the world and have become a common means of entry to various types of sophisticated equipment.

One of the major areas where tapes are used is in book and directory publishing. Computer directed phototypesetting has had to fight ordinary typesetting methods with no quarter given or asked. Unlike high speed printers which never have had any real competition (it was the only thing available), phototypesetting has had to prove it could do the job better than the old "hot metal" setting system. The problems have been met, faced, and generally licked, including the problem of computer directed hyphenation. There also have been many failures, but now phototypesetting seems to be technically sound. It still, however, requires expertise; top level technical assistance, which means it basically is not yet suitable for the computer room. It is suitable, apparently, for service bureau operations. But you have to find a service bureau that understands your problem.

Such places are appearing nowadays. One, in New York, is run by Harry Sedgewick, who has explained both the possibilities and the problems in recent magazine articles. His operation is using a Photon Zip 900, which uses a 264 character font (etched on a glass plate) and which can change fonts fairly simply. In directory and book work, he takes a computer tape from the client and produces a final copy ready for camera, at a basic cost of $.03 per full book line. In addition to flexibility of type fonts, the system provides faster turnaround than hot type, although somewhat slower than high-speed printer operations.

But it allows the data in the computer to be converted to good style hard copy quickly – and without using hours of printer time.

It, like the microfilm route, provides an alternative to the high speed printer. Obviously we will need such printers for years ahead. But both of these systems, and others, show the essential point. That the reign of the printer as the sole hardcopy output device is ending.

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COMPUTERWORLD financial

UCC Seeks 10% Interest in WU

DALLAS – University Computing Co. wants to acquire 750,000 common shares of Western Union Telegraph Co. stock. If its tender offer of $44 to WU shareholders is successful, UCC would hold 10% of the outstanding WU common, and would become WU's largest stockholder.

Sam Wyly, president of University Computing, stated that the purchase would be an investment and that he hoped to develop a closer working relationship between the two companies in which the special technical abilities of University Computing could aid in the development of expanded communication and transmission services by Western Union.

However, in New York, Russell McFall, chairman of Western union, has sent letters and telegrams to shareholders urging them not to be "stampeded" into tendering their shares to University Computing.

"Your board of directors and your management strongly urge you to reject the tender offer of University Computing Co. as not being in your best interest as shareholders, or the future growth of your company," McFall wrote.

"Your management considers the tender offer price to be grossly inadequate," he continued. "We are not surprised that University Computing wants to buy your stock. They must think it has greater than the tender price and are so eager to get it they are offering brokers $.80 per share – double the normal commission rate – for each share they get from you."

Louis Yaeger, a director and the largest single holder of Western Union Telegraph Co. stock, had a different reaction to the tender offer. In a statement issued by his lawyer, Yaeger said that while he wasn't making a recommendation in relation to the tender, he noted that University Computing "has done a remarkable job in the field of computer services" and "Western Union has nothing to lose by associating with another company whose proved know-how and energy in this important field can be of great value to it." Yaeger owns about 6% of Western Union's 7.5 million outstanding common.

Honeywell Group Expansion Seen

BOSTON – Honeywell Chairman James Binger told security analysts meeting here that he expects the worldwide activities of the newly formed Computer and Communications Group to be as large in dollar volume in 1975 as the entire company is today (more than $1 billion).

The analysts were also told that Honeywell research and development will be concentrated to a substantial degree on software; on smaller, faster, and less expensive computer memory systems; on integrated circuit development; and on experimental communications oriented products, Binger stated.

New Registrations

BURROUGHS CORP., 6071 Second Ave., Detroit, manufacturer of computers and peripheral equipment, filed a statement to register some $50 million of convertible subordinated debentures due 1993. Proceeds from the offering, with the price to be set by amendment, will be used for debt repayment. The underwriter is Kidder, Peabody & Co. Inc., 20 Exchange Place, New york.

COMPUTER MICROFILM CORP., 164 Madison Avenue, New York, operator of an automated microfilm service center, filed to register some 125,000 common ("Reg.A"). Proceeds from the offering, at $2 per share, will be used for debt repayment and will furnish working capital. The underwriter is Grimm & Davis, 54 Wall St., New York.

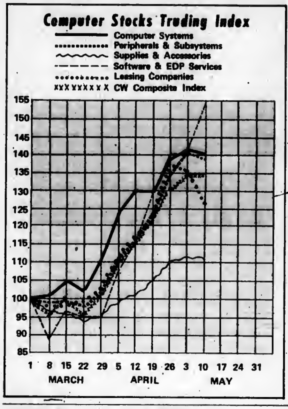
DATA AUTOMATION CO., INC., 7505 Carpenter Freeway, Dallas, a company which leases data processing equipment, filed a statement to register some 19,426 common, to be offered from time to time. Proceeds from the offering, with the price to be set by amendment (maximum $26.625) will go to selling stockholders. The underwriter has yet to be named.

DATRONIC RENTAL CORP., 69 W. Washington St., Chicago, a company which rents data processing equipment, filed a statement to register some $3 million of convertible subordinated debentures due 1983, to be offered for subscription by common stockholders. Proceeds from the offering, with the price to be set by amendment, will be used for debt repayment, equipment acquisition, and other corporate purposes. No underwriter.

DIEBOLD TECHNOLOGY VENTURE FUND, INC., 430 Park Ave., New York, a non-diversified closed-end investment company, filed to register some 500,000 capital shares. Proceeds from the offering, at $20 per share, will be used for investment. No underwriter.

INFORMATICS, INC., 5430 Van Nuys Blvd., Sherman Oaks, Calif., a company which provides programming services, filed to register some 30,000 common. Proceeds from the offering, with the price to be set by amendment (maximum $70) will furnish working capital. The underwriters are Dean Witter & Co., 632 S. Spring St., and Mitc[illegible]m, Jones & Templeton, Inc. 510 S. Spring St., both Los Angeles.

COMPUTERWORLD financial



NCA Up 57%; Index Up .23%

(Continued from page 1)

manage to edge up 0.23% during the week while the Dow Jones industrial average set a new 1968 high of 920 but closed at 913, down 0.65% for the week.

Digital Equipment suffered the largest loss in the Computer Systems sector, after it revised downward its nine months earnings statement. DEC lost 8%, closing at 141-1/4. Several of DEC's key computer design engineers resigned last month. Systems Engineering Labs declined 4% to 30-1/2; GE declined 3% to 91-1/2; NCR and Raytheon were off 2%. Gainers in the sector included Hewlett-Packard and Collins Radio, which both increased 5%; Scientific Controls, up 3%; and Control Data and Honeywell, up 2% each.

Losers outnumbered gainers almost three to one (14 to 5) in the Peripherals and Subsystems sector last week. Data Products, which had gained 17% in the previous week, fell 12% last week to 18-3/8. Both Bolt, Beranek & Newman and Fabritek declined 7%; Ampex was off 6% as was Sanders which continued to decline after losing 7% the previous week. Significant gains were made by Digitronics, up 14% to 25-3/4 and by Milgo Electronics, up 10%. Milgo had gained 66% in the previous week.

In the Supplies and Accessories sector, Baltimore Business Forms continued its decline and was off 8% to 14-3/4. Barry Wright fell 7%; Adams-Millis and Moore Business Forms both declined 5%. Memorex gained 11% during the week to close at 73-1/2. The 3M Company moved up 8% to 104-1/4 and set a 1968 high. Ennis Business Forms also rose 8%.

The Software and EDP Services sector index rose 10% last week. Several stocks continued to make large weekly moves. National Computer Analysts gained 57%, rising to 27-1/2, after having a 30% increase in the previous week. Brandon Applied Systems rose 29% to 18 after losing 14% in the previous week and gaining 53% a month ago. Computer Network closed at 60, up 20% last week. The stock had gained 25% in the previous week. University Computing, which is seeking to acquire 10% of Western Union's stock, moved up 17% to 111. Largest loser in the sector was Software Systems. The stock declined 15% to 11-1/2 after losing 13% in the previous week and gaining 82% three weeks ago.

In the Leasing sector losers outnumbered gainers almost four to one (11 to 3). Managemant Assistance was off 12% to 11-3/4; Computer Leasing declined 10%; Cyber-Tronics, biggest loser in the sector the previous week, lost 8%. Datronic Rental also lost 8%. The three gainers included U.S. Leasing, up 11% to 17; Data Processing Financial & General, up 4% to 144-1/4; and Leasco, up 2% to 155.

COMPUTER STOCKS: TRADING SUMMARY

Week Ending May 10, 1968

EXCHANGE	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	COMPUTER SYSTEMS	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
NYSE	163 3/8	220–157	216 1/2	• Burroughs	– 3/4	– 0.35	+ 32.52
NYSE	67 3/4	101– 65	79 3/4	Collins Radio	+ 3 5/8	+ 4.76	+ 17.71
NYSE	101 1/2	160– 95	155 3/4	• Control Data	+ 2 5/8	+ 1.71	+ 53.45
AMSE	102	160– 95	141 1/4	• Digital Equipment	– 12 3/4	– 8.28	+ 38.48
NYSE	87 1/4	100– 84	91 1/2	General Electric	– 3	– 3.17	+ 4.87
NYSE	60	84– 59	82 7/8	Hewlett-Packard	+ 4 3/8	+ 5.57	+ 38.13
NYSE	93 1/8	136– 89	133	• Honeywell	+ 2 3/4	+ 2.11	+ 42.81
NYSE	577	701–560	677 3/4	• IBM	– 10 1/4	– 1.49	+ 17.46
NYSE	108 7/8	141– 99	136 3/4	• Nat Cash Register	– 2 3/4	– 1.97	+ 81.65
NYSE	78 1/4	55– 45	52 3/4	• RCA	– 1/8	– 0.24	+ 12.53
NYSE	46 7/8	106– 73	95	Raytheon	– 2	– 2.07	+ 21.41
OTC	22 1/2	44– 20	42 1/8	• Scientific Controls Corp.	+ 1 1/8	+ 2.74	+ 87.22
NYSE	118 1/8	172–108	164	• Scientific Data	– 2 1/2	– 1.50	+ 38.84
NYSE	45	63– 42	55 3/8	• Sperry Rand	– –	– –	+ 23.61
OTC	22 1/2	33– 30	30 1/2	• Systems Engineering Labs.	– 1 1/4	– 3.94	+ 35.56

EXCHANGE	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	PERIPHERALS & SUBSYSTEMS	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
NYSE	58 3/8	80– 52	72 3/8	Addressograph-Multigraph	– 1/8	– 0.17	+ 23.98
OTC	21	58– 21	52	Alphanumeric	– 1	– 1.89	+147.62
NYSE	29	37– 26	30 3/8	Ampex	– 1 7/8	– 5.81	+ 4.74
OTC	17 1/4	27– 16	22 1/2	Bolt Beranek & Newman, Inc.	– 1 3/4	– 7.21	+ 30.43
AMSE	13 1/2	19– 12	15 3/8	Bunker-Ramo	– –	– –	+ 13.89
AMSE	32 1/8	47– 27	41 1/2	• Calcomp	– 1 3/4	– 4.05	+ 29.18
OTC	15 1/4	22– 13	18 3/8	• Data Products	– 2 5/8	–12.50	+ 20.49
OTC	19 1/4	27– 16	25 3/4	• Digitronics	+ 3 1/4	+14.44	+ 33.77
OTC	39	57– 38	48 1/2	• Electronic Memories	– 1/2	– 1.02	+ 24.36
OTC	10	13– 9	11 5/8	• Fabri-Tek	– 7/8	– 7.00	+ 16.25
OTC	34	56– 28	52	Gerber Scientific	– 2 1/2	– 4.59	+ 52.94
AMSE	16 7/8	45– 14	44 3/8	Milgo Electronics	+ 4 1/8	+10.18	+164.44
AMSE	115 1/8	195–108	183 1/2	• Mohawk Data Sciences	– 1 1/2	– 0.81	+ 59.39
OTC	74	136– 71	118	• Optical Scanning Corp.	– –	– –	+ 39.46
OTC	72	99– 64	99	Photon	+ 3	+ 3.12	+ 37.50
AMSE	25 5/8	38– 20	29 3/8	• Potter Instrument	+ 3/8	+ 1.28	+ 14.63
OTC	40 1/4	92– 38	85	• Recognition Equipment Corp.	– 3	– 3.41	+111.18
AMSE	16	29– 14	26	Rixon Electronics	– 1 1/4	– 4.59	+ 62.50
NYSE	46 1/8	66– 42	47 3/4	Sanders	– 3 1/4	– 6.37	+ 3.52
OTC	40 1/2	51– 35	50 1/2	• Tally Corp	+ 1 1/2	+ 3.06	+ 24.69
NYSE	242 1/4	304–229	285	Xerox	– 7 1/4	– 2.48	+ 17.65

EXCHANGE	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	SUPPLIES & ACCESSORIES	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
OTC	48 1/2	64– 41	59 1/2	• Acme Visible	+ 1 1/2	+ 2.59	+ 22.68
NYSE	41	32– 19	25 7/8	Adams-Millis	– 1 3/8	– 5.05	+ 26.22
OTC	13 5/8	17– 13	14 3/4	• Baltimore Business Forms	– 1 1/4	– 7.81	+ 8.26
AMSE	27	36– 22	32 1/2	• Barry Wright	– 2 1/2	– 7.14	+ 20.37
OTC	27 1/4	33– 26	31 1/4	• Ennis Business Forms	+ 2 1/4	+ 7.76	+ 14.68
NYSE	84 1/8	104– 81	104 1/4	• 3M Company	+ 8	+ 8.31	+ 23.92
OTC	58	74– 49	73 1/2	• Memorex	+ 7 1/2	+ 11.36	+ 26.72
TOR	27 1/4	32– 25	30	• Moore Business Forms	– 1 3/4	– 5.51	+ 10.09
NYSE	57 1/4	69– 47	68	Nashua Corp.	– 1/2	– 0.73	+ 18.78
OTC	31 1/4	27– 30	36	Reynolds & Reynolds	– 1	– 2.70	+ 15.20
OTC	34 1/2	35– 25	27	• Standard Register	—	– –	– 21.74
NYSE	37 3/4	44– 33	34 1/4	• Uarco	– 1 3/4	– 4.86	– 9.28
AMSE	14 1/4	22– 13	19 3/8	Wabash Magnetics	+ 3/4	4.03	+ 35.96
OTC	25 3/4	36– 24	32 1/4	• Wallace Business Forms	– 1 1/4	– 3.73	+ 25.24

EXCHANGE	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	SOFTWARE & EDP SERVICES	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
OTC	17	27– 14	27 1/2	• Applied Data Research	+ 1/2	+ 1.85	+ 61.76
OTC	15 1/2	24– 15	19	• Aries	+ 1/2	+ 2.70	+ 22.58
AMSE	47	66– 42	57 7/8	Automatic Data Processing	– 1 1/8	– 1.91	+ 23.14
OTC	9	19– 6	18	• Brandon Applied Systems	+ 3 3/4	+ 28.57	+100.00
AMSE	22 7/8	43– 21	26 7/8	Computer Applications	– 1 3/4	– 6.12	+ 17.49
OTC	30	60– 24	60	Computer Network	+ 10	+ 20.00	+100.00
AMSE	40	63– 32	46 1/4	• Computer Sciences	– 1 1/2	– 3.15	+ 15.62
OTC	39	62– 27	39	• Computer Usage	– 1/2	– 1.27	– –
OTC	36 1/2	58– 36	31 1/2	• Computing and Software	– 2 5/8	– 4.85	+ 41.09
OTC	12 1/2	20– 9	14 3/4	• Digitek	– 1/4	– 1.67	+ 18.00
AMSE	38 3/8	52– 26	43 1/2	Electronic Computer Prog. Inst.	+ 2 1/2	+ 6.10	+ 13.35
OTC	35	60– 32	58	• Informatics	– 1/2	– 0.85	+ 65.71
OTC	11 1/2	27– 8	27 1/2	• National Computer Analysts	+ 10	+ 57.14	+139.13
AMSE	31	43– 28	41 1/8	Planning Research	– 1/8	– 0.31	+ 32.66
OTC	9	15– 8	11 1/2	Software Systems	– 2	– 14.81	+ 27.77
OTC	20 1/2	22– 13	14 3/4	TBS Computing Centers, Inc.	– 1/4	– 1.67	– 28.05
OTC	63	111– 57	111	• University Computing	+ 16	+ 16.83	+ 76.19

EXCHANGE	BASE PRICE 3-1-68	1968 RANGE	CLOSING PRICE	LEASING COMPANIES	WEEK NET CHANGE	WEEK % CHANGE	% CHANGE FROM BASE
OTC	19 1/4	25– 18	24 1/2	Chandler Leasing	– –	– –	+ 27.27
AMSE	25 1/8	33– 21	30 5/8	• Computer Leasing	– 3 1/4	– 9.60	+ 21.89
OTC	12 1/4	19– 11	14 1/2	• Cyber-Tronics	– 1 1/4	– 7.94	+ 18.37
AMSE	106 5/8	184– 94	144 1/4	• Data Proc. Financial & General	+ 5 5/8	+ 4.06	+ 35.28
OTC	12 1/2	17– 11	11 3/8	Datronic Rental	– 1	– 8.08	– 9.00
OTC	20	35– 18	34 1/2	Dearborn Computer	– –	– –	+ 72.50
OTC	13 1/4	17– 12	16	• DPA, Inc.	– 1 1/8	– 6.57	+ 20.75
AMSE	28 3/4	43– 27	39 1/4	• GC Computer Corp.	– 1 3/4	– 4.27	+ 36.52
AMSE	98	199– 90	155	• Leasco	+ 3 1/2	+ 2.31	+ 58.16
AMSE	45 7/8	96– 41	85 3/8	• Levin-Townsend Computer Corp.	– 5/8	– 0.73	+ 86.10
OTC	10 1/2	16– 7	9 1/2	• LMC Data, Inc.	– 1/2	– 5.00	– 9.52
OTC	10 7/8	16– 10	11 3/4	• Management Assistance	– 1 5/8	– 12.15	– 8.04
AMSE	41 5/8	53– 23	46 7/8	National Equip. Rent.	– 2 5/8	– 5.30	+ 12.61
AMSE	38	64– 35	57 3/4	• Randolph Computer Corp.	– 3 7/8	– 6.29	+ 51.97
AMSE	10 7/8	18– 10	17	U.S. Leasing	+ 1 3/4	+ 11.47	+ 56.32

*Companies included in Computerworld's stock trading index for each sector.

Wall Street's View

CSC Cited as Shorting Situation

SANDERS ASSOCIATES – C.B. Richard Ellis & Co. suggests that the stock has shown little zeal in recovering. There have been, however, a considerable number of block transactions and the total daily volume has increased quite sharply, suggesting that an accumulation is taking place. A recovery move to the 58-60 area on a short term basis could now take place, according to C.B. Richard Ellis & Co.'s analysts.

SCIENTIFIC DATA SYSTEMS – C.B. Richard Ellis & Co. has raised SDS's target from 175-180 to 188-192 and notes a possibility of an over-run to 200. Bache & Co. recommends that traders take advantage of dips to add to previous positions, considering the support which lies in the 150-160 area.

COMPUTER SCIENCES – Philips, Appel & Walden reports that CSC President Fletcher Jones keeps selling his shares. They suggest watching the stock for possible shorting opportunity.

CONTROL DATA – Both Bache & Co., and C.B. Richard Ellis & Co. recommend purchases of CDC at current levels, and see an initial move to the 165 level, the stock's all time high.

GC COMPUTER – Purcell, Graham & Co.'s chartist notes that the stock has good support in the 39-41 area and recommends that the stock be bought for a trading move to the low 50's. P.G. & Co. warns, however, that caution should be exercised because of the thin market for shares of GC Computer.

'Free' Software Might Be Illegal, Jones Says

The current pricing practices in the industry, with software being a "free" product included with the hardware, may be in violation of the anti-trust laws, Richard Jones, president of Applied Data Research, told a Spring Joint Conference audience. One of the well known techniques for restricting free, competitive markets, he said, is the so-called tie-in sale, where a producer in a strong market position expands his market by forcing consumers to purchase other products along with the desired product.

"These arrangements have been time and time again held to be in restraint of trade," he said. "United Shoe Machinery was prevented from continuing the practice of selling only to shoe manufacturers who used their equipment exclusively. Eastman Kodak was prevented from selling film processing along with the film, IBM was prevented from restricting the use of their equipment only to those who used punched cards made by IBM."

One of the panelists, Dr. Herbert Grosch, director of the National Bureau of Standards Center for Computer Technology, won both laughter and applause by declaring that if software were now being charged for, no one would be bothering to look at PL/1.

Action to Be Taken

Grosch's main point, however, startled his audience. He told them that he intends to recommend strongly to the commissioner of the Supply Section, General Services Administration, that the section begin immediate discussions on a policy for the separation of pricing for hardware and software for the next generation of computers.

Grosch emphasized that his action would be a recommendation only, and no guarantee of subsequent action could be made. He felt there was a possibility that no action could be taken until a fifth generation has been introduced in 1976 or thereabouts.

"Bare Bones" System

Grosch recommends that a "bare bones" computer system, consisting of the hardware and system diagnostics and very elementary Level 1 software, should be considered as part of the basic price. Additional Level 1 software and utility, application, and programming language packages would be separately priced.

Grosch felt that if this policy were implemented, IBM could easily ignore it. In 1970 the federal government will buy about 6% of the value of EDP systems, sold that year. IBM currently has about 50% of the government market, and might well be able to afford to lose 3% of the overall market in order to avoid the impact which separate pricing might have on its commercial marketplace.

Pointing up the considerable difficulty that the officials of the Federal Supply Section have in dealing with IBM, Grosch mentioned that the Federal Supply Schedule (which determines the contract terms under which computers are acquired each year) requires one or two meetings with firms such as Control Data and Univac, but required 41 meetings with IBM last year to achieve agreement on contract terms.

calendar

May 20-23, Washington, D.C. – "Data Communications for Management Control." Contact: The American University Center for Technology and Administration, 3900 Wisconsin Avenue, NW, Washington, D.C. 20016.

June 3-5, Chicago – "Computer Operation Management and Control." Contact: Brandon Systems Institute, 1611 North Kent Street, Arlington, Va.

June 4-5, Los Angeles – "Management Standards for Data Processing." Contact: Brandon Systems Institute, 1611 North Kent Street, Arlington, Va.

June 6, Cincinnati – "Computer Graphics I." Contact: James M. Adams, Jr., Director of Education, ACM, 211 East 43rd Street, New York, N.Y. 10017. (Also June 7, Detroit.)

June 17-21, New York – Third DMAA Computer Institute. Contact: Direct Mail Advertising Association, 230 Park Avenue, New York, N.Y. 10017.

June 17-28, Los Angeles – "Computer Assisted Instruction Systems." Contact: Registrar, Education and Training Consultants Co., 815 Moraga Drive, Los Angeles, California 90049.

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ACM Guidelines

The ACM guidelines, reproduced here, are the only known and established rules of ethics in the computer field. COMPUTERWORLD therefore believes it is important that everyone be aware of them. (See editorial on Page 4).

Introduction

This set of guidelines was adopted by the Council of the Association for Computing Machinery on November 11, 1966 in the spirit of providing a guide to the members of the Association. In the years to come this set of guidelines is expected to evolve into an effective means of preserving a high level of ethical conduct. In the meantime it is planned that ACM members will use these guidelines in their own professional lives. They are urged to refer ethical problems to the proper ACM authorities as specified in the Constitution and Bylaws to receive further guidance and in turn assist in the evolution of the set of guidelines.

Preamble

The professional person, to uphold and advance the honor, dignity and effectiveness of the profession in the arts and sciences of information processing, and in keeping with high standards of competence and ethical conduct: Will be honest, forthright and impartial; will serve with loyalty his employer, clients and the public; will strive to increase the competence and prestige of the profession; will use his special knowledge and skill for the advancement of human welfare.

Relations With the Public

1.1 An ACM member will have proper regard for the health, privacy, safety and general welfare of the public in the performance of his professional duties.

1.2 He will endeavor to extend public knowledge, understanding and appreciation of computing machines and information processing and achievements in their application, and will oppose any untrue, inaccurate or exaggerated statement or claims.

1.3 He will express an opinion on a subject within his competence only when it is founded on adequate knowledge and honest conviction, and will properly qualify himself when expressing an opinion outside of his professional field.

1.4 He will preface any partisan statement, criticisms or arguments that he may issue concerning information processing by clearly indicating on whose behalf they are made.

Relations With Employers and Clients

2.1 An ACM member will act in professional matters as a faithful agent or trustee for each employer or client and will not disclose private information belonging to any present or former employer or client without his consent.

2.2 He will indicate to his employer or client the consequences to be expected if his professional judgment is over-ruled.

2.3 He will undertake only those professional assignments for which he is qualified and which the state of the art supports.

2.4 He is responsible to his employer or client to meet specifications to which he is committed in tasks he performs and products he produces, and to design and develop systems that adequately perform their function and satisfy his employer's or client's operational needs.

Relations With Other Professionals

3.1 An ACM member will take care that credit for work is given to those to whom credit is properly due.

3.2 He will endeavor to provide opportunity and encouragement for the professional development and advancement of professionals or those aspiring to become professionals with whom he comes in contact.

3.3 He will not injure maliciously the professional reputation or practice of another person and will conduct professional competition on a high plane. If he has proof that another person has been unethical, illegal or unfair in his professional practice concerning information processing, he should so advise the proper authority.

3.4 He will cooperate in advancing information processing by interchanging information and experience with other professionals and students and by contributing to public communications media and to the efforts of professional and scientific societies and schools.

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DEC's Computer Lab allows a student to learn how a computer works.

Device Teaches Computer Logic

MAYNARD, Mass. – A device that teaches digital computer logic comes complete with a "do it yourself" workbook good for up to 50 hours of laboratory training. Designed for use in high schools, technical schools, junior colleges, and universities, the Computer Lab is also applicable to logic circuit experiments in industry and research laboratories.

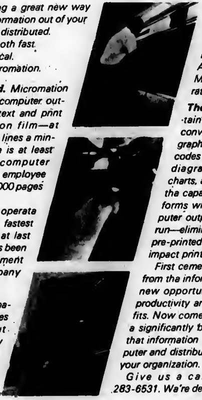
The teaching device, introduced by Digital Equipment Corp. 146 Main St., helps a student through four levels of instruction. First, the student learns logic gate operation by connecting patch cords to the input and output terminals of graphic symbols he finds on a panel. Second, the student proceeds to build counters, equality detectors, and shift registers. Third, these digital building blocks are used to make subsystems such as adders, code converters, and BCD (binary coded decimal) counters. Finally, computer design problems such as addition, subtraction, multiplication, and division are presented to the student.

Built-In Power

Monolithic TTL integrated circuits are used with the Computer Lab to provide 18 nand gates, four and-nor gate combinations, eight J-K flip-flops, and a variable frequency clock. Also included are three manually operated pulser switches, eight indicator lights and one 8-bit switch register. There is a built-in power supply for converting line power into DC logic levels. Each gate is represented by Mil-Std-806 symbology with eyelet terminals in the input and output lines.

Operational Power

A student can move back to a lower level at any time that he desires to try out additional ideas or to reinforce operation of components. At every level the student can "learn by doing" because an input signal's effect can be shown immediately by indicator lights. As a student becomes more adept, several Computer Labs can be connected together, one supervising another, thus increasing operational power. Moreover, the student is said to be completely free to design his own experiments and his own digital subsystems, because of the variety of logic circuits.



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